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| 10/550,096 | 08/31/2006 | Joergen Seerup | 1033452-000015 | 5910 |

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BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

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| EXAMINER |
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FORD, JOHN K

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| ART UNIT | PAPER NUMBER |
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3744

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| NOTIFICATION DATE | DELIVERY MODE |
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08/05/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com
offserv@bipc.com

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|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/550,096 | Applicant(s) SEERUP ET AL. | |
| | Examiner John K. Ford | Art Unit 3744 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 May 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 4,6-8,12 and 15-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,9-11,13,14,19 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
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| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/21/05 and 11/2/05</u> . | 6) <input type="checkbox"/> Other: _____ |

Applicant's response of 17 May 2010 has been studied carefully. Applicant's election of the second species wherein specific size is based on "desired value deviation", without traverse, is acknowledged. Applicant's election of the fourth species wherein setting is changed by a change in the opening times of the valve, also without traverse, is acknowledged. Applicant has identified claims 1-3, 5, 9-11, 13, 14, 19 and 20 as readable on the elected species.

Applicant's submissions regarding the three foreign counterpart prosecutions are greatly appreciated, particularly the translation of the most recent office action in the EPO. Please keep the examiner updated with the most recent amended claims pending at the EPO and the EPO's most recent rejections/indications of allowability.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5, 13 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The examiner is confused by the language of claims 5, 13 and 14. The concept is much better explained on page 17, lines 17-24 of the specification dated 21 Sep 2005. Specifically in claims 5, 13 and 14, it is unclear what is meant by the phrase

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“when **the** heat exchanger is opened or closed”. What heat exchanger is that? Then applicant states “changing the setting of **a** heat exchanger”. What heat exchanger is that? Finally, the claim ends with a recitation of “**this** heat exchanger”. It is unclear which of the aforementioned heat exchangers applicant is referring to. The important point to remember is that, unlike the embodiment of Figure 2 of Laing, applicant’s system does not have to close all of the valves except one, it apparently leaves all of the valves open except one in performing the method steps set forth in claims 5, 13 and 14.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5, 11, 13 and 14 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Laing (USP 6,390,381).

Laing corresponds to DE 19911866 (and appears to be identical to it) discussed in the English translation of the EPO office action of 23 February 2010 in case No. 02 01 579, which translation is incorporated here by reference. As noted by the EPO examiner, in the aforementioned translation, Laing, at col. 1, lines 20-25 (all references made to Laing are to USP '381), discloses the same problem that applicant has identified, namely the zone with the least flow resistance (i.e. the "short loop") in the absence of any balancing valve (or other restriction) receives too much flow. As disclosed in claim 2 of Laing, the temperature difference for each loop is compared to determine the loop with the largest temperature difference (i.e. the largest specific size of the heat demand). The specific sizes of the other loops (including that displaying the smallest heat demand) are changed in a manner to increase the heat demand (i.e. to make the temperature difference larger) up to the value of the loop with the largest temperature difference. Regarding claims 5, 13 and 14, to the extent that these claims can be understood, the system disclosed by Laing in Figure 2 will inherently do this since only one heat exchanger is open at any given moment (i.e. all of the throttle valves are closed except one).

Claims 1-3, 5, 11, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Laing (USP 6,390,381) and the Wikipedia description of an algorithm for finding the greatest value from a list of numbers by comparing (see step 2. below) each of the numbers on the list.

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Laing is described above and that explanation is incorporated here by reference.

The Wikipedia algorithm description is reproduced immediately below:

One of the simplest algorithms is to find the largest number in an (unsorted) list of numbers. The solution necessarily requires looking at every number in the list, but only once at each. From this follows a simple algorithm, which can be stated in a high-level description English prose, as:

High-level description:

1. Assume the first item is largest.
2. Look at each of the remaining items in the list and if it is larger than the largest item so far, make a note of it.
3. The last noted item is the largest in the list when the process is complete.

(Quasi-)formal description: Written in prose but much closer to the high-level language of a computer program, the following is the more formal coding of the algorithm in pseudocode or pidgin code:

Algorithm LargestNumber

Input: A non-empty list of numbers L .

Output: The *largest* number in the list L .

```
largest ←  $L_0$ 
for each item in the list ( $\text{Length}(L) \geq 1$ ), do
  if the item > largest, then
    largest ← the item
return largest
```

- " \leftarrow " is a loose shorthand for "changes to". For instance, " $\text{largest} \leftarrow \text{item}$ " means that the value of *largest* changes to the value of *item*.
- "**return**" terminates the algorithm and outputs the value that follows.

For a more complex example of an algorithm, see Euclid's algorithm for the greatest common divisor, one of the earliest algorithms known.

As disclosed by the Wikipedia description of an algorithm for finding the greatest value from a list of numbers by comparing (see step 2. above) each of the numbers on the list is a well known algorithm that would have been obvious to have used to find the largest (or with minor modification of the algorithm, the smallest) value of temperature

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difference in the Laing reference by comparison of the values of temperature difference for each of the loops of Laing as disclosed in claim 2 of Laing.

The computer algorithm (as well as the associated program) of Wikipedia discloses finding the largest value by comparing all of the values with each other. To have done this in the prior art to Laing to find the largest or smallest value of heat demand would have been obvious to one of ordinary skill in the art.

Claims 9-10 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laing alone or Laing/Wikipedia as applied to claims 1-3 and 11 above, and further in view of Neve (USP 6,454,179) and optionally Skelton (USP 6,171,254).

Neve, assigned to the current assignee, discloses a simple pulse width modulated solenoid valve that acts as a proportional control valve (a proportional control valve being disclosed by Laing). To have used the simple pulse width modulated solenoid valve of Neve that acts as a proportional control valve in place of the proportional control valve of Laing would have been obvious to reduce costs. See column 3, lines 11-13, of Skelton for an explicit teaching of the equivalence of proportional control valves and duty cycle control valves as well as their relative costs.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to John K. Ford whose telephone number is 571-272-4911. The examiner can normally be reached on Mon.-Fri. 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on 571-272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John K. Ford/
Primary Examiner, Art Unit 3744